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| 09/817,155 | 03/27/2001 | Masato Hasegawa | 50395-096 | 7094 |

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| EXAMINER | |
|---|---|
| LEE, SHUN K | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2878 | |

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/817,155 | HASEGAWA ET AL. | |
| | Examin r | Art Unit | |
| | Shun Lee | 2878 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 October 2003 and 21 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 May 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *100703*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## DETAILED ACTION

### *Specification*

1. The amendment filed 21 October 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: replacement of "cobal" with --54% Fe - 29% Ni - 17% Co alloy--. The specification as filed discloses (pg. 16, line 10) "54% Fe - 29% Ni - 17% Co alloy (trade name: cobar)". However, applicant has fail to supply any factual support that "cobal" as disclosed in the specification as originally filed is the same as "cobar".

Applicant is required to cancel the new matter in the reply to this Office Action.

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 5, 6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tower *et al.* (US 6,020,628) in view of Roy *et al.* (US 3,974,249) and Grossinger *et al.* (US 5,712,622).

In regard to claims **1**, **5**, and **6**, Tower *et al.* disclose (Figs. 1 and 5) a sensor, having a lens body (12), comprising ceramic (column 2, line 63 to column 3, line 7), a supporting part (16, 60), which supports said lens body (12), and a detection part (*i.e.*, optically active portion 32 of the electronic device 24), which detects the light that has been transmitted through said lens body (12). While Tower *et al.* also disclose (column 2, line 63 to column 3, line 7) that the lens body is formed from any suitable ceramic (*e.g.*, the main component is $MgAl_2O_4$ which is also referred to as spinel) or glass such that that light of a desired wavelength will pass through the lens body with minimal distortion or attenuation, the sensor of Tower *et al.* lacks that the $MgAl_2O_4$ lens body has 50% or more linear light transmittance at 3 to 5 μm wavelength and contains a pigment that shields visible light. However, the properties of $MgAl_2O_4$ are well known in the art. For example, Roy *et al.* teach (column 5, lines 6-55) that $MgAl_2O_4$ has 50% or more linear light transmittance at 3 to 5 μm wavelength. Further, Grossinger *et al.* teach

(column 2, lines 1-20; column 4, lines 40-55) to provide a lens with pigment particles that shields visible light from the sensor without distorting or attenuating infrared radiation. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a pigment in the $MgAl_2O_4$ lens body (having 50% or more linear light transmittance at 3 to 5 μm wavelength) of Tower *et al.*, in order to shield the optically active portion of the electronic device from visible light without distorting or attenuating the desired wavelengths of infrared radiation.

In regard to claim **9** which is dependent on claim 1, Tower *et al.* also disclose (column 3, lines 35-45, column 4, lines 44-53) that said supporting part (16, 60) is comprised of metal.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tower *et al.* (US 6,020,628) in view of Roy *et al.* (US 3,974,249) and Grossinger *et al.* (US 5,712,622) as applied to claim 1 above, and further in view of Carnall, Jr. *et al.* (US 3,131,238).

In regard to claims **3** and **4** which are dependent on claim 1, while Tower *et al.* also disclose (column 2, lines 63-66) that the lens body is formed from any suitable ceramic or glass such that that light of a desired wavelength will pass through the lens body with minimal distortion or attenuation, the modified sensor of Tower *et al.* lacks that the main component of said ceramic of said lens body is zinc sulfide (ZnS) having 50% or more linear light transmittance at 8 to 12 μm wavelength. However, zinc sulfide ceramic lenses are well known in the art. For example, Carnall, Jr. *et al.* teach (column 5, line 50 to column 6, line 62) a 1.6 mm thick zinc sulfide infrared optical element have

a linear light transmittance of 50% or more (*e.g.*, 75% at 8 μm wavelength). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that a suitable material for the lens body of Tower *et al.* is zinc sulfide which has a linear light transmittance of 50% or more at a desired infrared wavelength (*e.g.*, 3 to 5 μm wavelength or 8 to 12 μm wavelength), in order to pass a desired infrared wavelength light (*e.g.*, 8 μm wavelength) through the lens body with minimal distortion or attenuation.

7. Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tower *et al.* (US 6,020,628) in view of Roy *et al.* (US 3,974,249) and Grossinger *et al.* (US 5,712,622) and Scherber *et al.* (US 4,708,419).

In regard to claims **2** and **10**, Tower *et al.* in view of Roy *et al.* and Grossinger *et al.* is applied as in claim 1 above. The modified sensor of Tower *et al.* lacks a resin layer (*e.g.*, a polyethylene layer) that covers at least the light receiving surface of the ceramic part of the lens body (12). Scherber *et al.* teach (column 3, lines 3-58) to provide a polyethylene layer overlying infrared components in order to protect the infrared components. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a polyethylene layer overlying the lens body in the modified sensor of Tower *et al.*, in order to protect the lens body as taught by Scherber *et al.*

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tower *et al.* (US 6,020,628) in view of Roy *et al.* (US 3,974,249), Grossinger *et al.*

(US 5,712,622), and Scherber *et al.* (US 4,708,419) as applied to claim 10 above, and further in view of Silvestrini *et al.* (US 4,323,619).

In regard to claim **11** which is dependent on claim 10, the modified sensor of Tower *et al.* lacks that said polyethylene is high-density polyethylene. The infrared transmission of high-density polyethylene is well known in the art. For example, Silvestrini *et al.* teach (column 3, lines 18-27) that a 100 μm thick high-density polyethylene film has an absorption of between 10% to 15% in the 8-13 μm range. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a high-density polyethylene layer overlying the lens body in the modified sensor of Tower *et al.*, in order to protect the lens body while minimizing infrared attenuation.

9. Claims 1, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castleman (US 6,153,881) in view of Grossinger *et al.* (US 5,712,622).

In regard to claim **1**, Castleman discloses (Figs. 8 and 9) a sensor, having a lens body (232), comprising ceramic (*i.e.*, sapphire; column 13, lines 36-47), a supporting part (230), which supports said lens body (232), and a detection part (236), which detects the light that has been transmitted through said lens body (232). The ceramic sensor of Castleman lacks a pigment that shields visible light is contained in the lens body. Grossinger *et al.* teach (column 2, lines 1-20; column 4, lines 40-55) to provide a lens with pigment particles that shields visible light from the sensor without distorting or attenuating infrared radiation. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a pigment in the lens body

of Castleman, in order to shield the detection part from visible light without distorting or attenuating the desired wavelengths of infrared radiation.

In regard to claims **7** and **8** which are dependent on claim 1, Castleman also discloses (column 13, lines 11-20 and 36-47) that said supporting part is comprised of resin (*i.e.*, plastic housing).

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Castleman (US 6,153,881) in view of Grossinger *et al.* (US 5,712,622) as applied to claim 1 above, and further in view of Adachi *et al.* (US 4,302,674).

In regard to claim **12** which is dependent on claim 1, the modified sensor of Castleman lacks that said supporting part includes a cylindrical part, which is formed between the portion of said lens body that transmits light and said detection part. Adachi *et al.* teach (column 5, lines 46-58) to provide a cylindrical part in order to receive only substantially perpendicular radiation relative to the detection part. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a cylindrical part between the lens body and the detection part in the modified sensor of Castleman, in order to receive only substantially perpendicular radiation relative to the detection part as taught by Adachi *et al.*

***Response to Arguments***

11. Applicant's arguments filed 21 October 2003 have been fully considered but they are not persuasive.

Applicant argues (last paragraph on pg. 11 of remarks filed 21 October 2003) that Tower *et al.* do not disclose a ceramic infrared sensor, but rather, generally

discloses an optically transparent ceramic lens that is press-fit into an aperture formed in a metallic housing and a metallic coating layer then deposited on the aperture walls. Examiner respectfully disagrees that Tower *et al.* do not disclose a ceramic infrared sensor. Tower *et al.* state (column 2, line 55 to column 3, line 7) that "The optically transparent member **12**, such as a lens, transmits photonic signals from a fiber optic cable or other optic device to an optically active portion **32** of the electronic device **24**. Circuit traces **34** formed on an electrically active surface of the electronic device **24** then electrically interconnect the optically active portion **32** with electrically active portions of the hybrid electronic package. The optically transparent member **12** is formed from any suitable ceramic or glass. By "optically transparent" it is meant that light of a desired wavelength will pass through the member with minimal distortion or attenuation. One suitable material is magnesium aluminate ($MgAl_2O_4$ also referred to as Spinel). Other suitable materials for the optically transparent member include crystalline carbon (diamond), aluminum oxide (sapphire) and aluminum oxide+chromium (ruby). Generally, the selection of the optically transparent material is dependent on the wavelength of light to be transmitted and the coefficients of thermal expansion of the housing and of the member". Thus, the optically active portion **32** of the electronic device **24** is the detection part which detects the light that has been transmitted through the lens body **12** formed from any suitable ceramic. Therefore it is clear that Tower *et al.* disclose a ceramic infrared sensor. Further in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of

references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues (first paragraph on pg. 12 of remarks filed 21 October 2003) that Grossinger *et al.*'s disclosure is not enabled for using pigmented particles in a ceramic lens body, as claimed since Grossinger *et al.* disclose that pigmentation has numerous drawbacks in the Background of the Invention. Examiner respectfully disagrees. It should be noted that the entirety of a patent is relevant as prior art (see MPEP § 2123). Grossinger *et al.* state (column 2, lines 1-20) that " ... method known in the prior art ... pigment particles, which have substantially no effect on infrared radiation, are operative to absorb and diffuse incident visible radiation ... pigmentation of the detector window or lens has a number of drawbacks. Firstly, the pigmented detector window or lens also absorbs and diffuses visible radiation originating from within the detector, particularly light originating from indicator LEDs mounted within the detector, making such indicator LEDs practically invisible through the window or lens. Secondly, existing pigmented windows and lenses are not suitable for outdoor use since they tend to become brittle and less transmissive to infrared light after being exposed to direct sunlight, and/or other outdoor weather conditions, for a long period of time". Thus it can be concluded that known prior art pigmentation should probably not be used with indicator LEDs within the detector or used outdoors. On the other hand, these drawbacks do not exist when indicator LEDs are not used within the detector or not used outdoors. It is important to recognize that the ceramic infrared sensor as disclosed by Tower *et al.* does not require indicator LEDs within the detector or

outdoors use. Thus the drawbacks of known detector window or lens pigmentation are not even relevant to the ceramic infrared sensor of Tower *et al.* since in the disclosure of Tower *et al.* there is no requirement or suggestion of indicator LEDs within the detector or outdoors use. Moreover, Grossinger *et al.* explicitly state (column 4, lines 43-54) that "Therefore, in some preferred embodiments of the invention, diffraction grating **30** is used in conjunction with additional means (not shown in the drawings) for shielding sensor **35** from visible radiation, for example using pigmented optical elements in detector **10**. It should be appreciated, however, that since substantial shielding is performed by grating **30**, some of the undesired effects of the additional shielding means are avoided. For example, if pigmentation is used, the amount of pigment can be reduced considerably, thereby enabling the use of indicator light emitting diodes (LEDs) within housing **15**. The reduced pigmentation also makes the detector more durable in outdoor conditions". Thus it is clear that Grossinger *et al.* explicitly teach the use of pigments in some preferred embodiments and further teach methods for minimizing the known detector window or lens pigmentation drawbacks.

Applicant argues (second paragraph on pg. 12 of remarks filed 21 October 2003) Grossinger *et al.* teach optionally using pigmentation in the detector 10 (col. 4, lines 40-55), but does not disclose the use of pigments included in the lens body, much less a ceramic lens body, as claimed. Examiner respectfully disagrees. The key phrase is " ... using pigmented optical elements in detector **10** ... " in column 4, lines 43-54 of Grossinger *et al.* (see above). It is important to recognize that it is the optical elements of detector **10** which is optionally pigmented. As discussed above, Grossinger *et al.*

further teach methods for minimizing the known detector window or lens pigmentation drawbacks. Therefore, Grossinger *et al.* teach optional pigmented optical elements (such as an optional pigmented lens 25 in Fig. 1).

In response to applicant's argument (first two paragraphs on pg. 13 of remarks filed 21 October 2003) that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, there is some teaching, suggestion, or motivation to do so found in the references themselves. First it should be recognized that anti- is a prefix defined[1] as "Counteracting; neutralizing" and reflect is defined[1] as "To throw or bend back (light, for example) from a surface". Thus an anti-reflective coating is a coating which counteracts or neutralizes throwing or bending back of incident radiation from a surface. Therefore, the ceramic infrared sensor of Tower *et al.* comprises of an optically transparent ceramic member **12** and a coating which counteracts or neutralizes reflections of radiation at desired wavelengths. Second it should be recognized that pigmented detector windows and lens are known in the art (see for example column 2, lines 1-20 of Grossinger *et al.* cited above) wherein the pigment provides attenuation of radiation at undesired wavelengths (*e.g.*, pigments

which absorb visible and have substantially no effect on infrared). Thus an anti-reflective coating provides a first function of minimizing reflections and pigments provides a second function of attenuating radiation at undesired wavelengths while transmitting radiation at desired wavelengths. Therefore an anti-reflective coating is used to minimize reflections of a desired wavelengths and pigments are used to attenuate undesired wavelengths and transmit desired wavelengths. In summary, the objective evidence of record (Tower *et al.* and Grossinger *et al.*) clearly provides factual basis that a lens transmit only the desired wavelength while minimizing reflections of desired wavelengths from the lens surface when using both pigments which attenuate undesired wavelengths and transmit desired wavelengths and an anti-reflective coating which minimizes reflections of desired wavelengths. Further, the motivation to combine or modify the teachings of the prior art found in the references themselves. Tower *et al.* teach (column 2, lines 63-66) that the ceramic lens should pass light of a desired wavelength through the ceramic lens with minimal distortion or attenuation. Grossinger *et al.* teach (column 2, lines 1-20; column 4, lines 40-55) to add pigments to the optical elements which absorb visible (*i.e.*, undesired wavelengths) and have substantially no effect on infrared (*i.e.*, desired wavelengths) in order to shield visible radiation from sensor (35). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a pigment in the $MgAl_2O_4$ lens body (having 50% or more linear light transmittance at 3 to 5 μm wavelength) of Tower *et al.*, in order to shield the optically active portion of the electronic device from

[1] The American Heritage® Dictionary of the English Language, Third Edition copyright © 1992 by

visible light without distorting or attenuating the desired wavelengths of infrared radiation.

In response to applicant's argument (last paragraph on pg. 13 to first two paragraphs on pg. 15 of remarks filed 21 October 2003) that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, there is some teaching, suggestion, or motivation to do so found in the references themselves. As discussed above, Grossinger *et al.* teach (column 2, lines 1-20; column 4, lines 40-55) to add pigments to the optical elements which absorb visible (*i.e.*, undesired wavelengths) and have substantially no effect on infrared (*i.e.*, desired wavelengths) in order to shield visible radiation from sensor (35). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a pigment in the $MgAl_2O_4$ lens body (having 50% or more linear light transmittance at 3 to 5 μm wavelength) of Tower *et al.*, in order to shield the optically active portion of the electronic device from visible light without distorting or attenuating the desired wavelengths of infrared radiation.

***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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